

نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره: کلاس: دوازدهم ریاضی ۲ الف) $\frac{ x +1}{ x -1} = y \quad x = \frac{-2y-1}{y-1} \quad x = \frac{y+1}{y-1} \quad \frac{y+1}{y-1} \geq \frac{1}{1-\frac{1}{y-1}}$ $R_A: (-\infty, -\frac{1}{2}] \cup (\frac{1}{2}, +\infty)$ ب) $y = \frac{x^2+1}{ x }$ $x > 0 \Rightarrow y = \frac{x^2+1}{x} = x + \frac{1}{x} \Rightarrow R = [1, +\infty)$ $x < 0 \Rightarrow y = \frac{x^2+1}{-x} = -x - \frac{1}{x} = -(\frac{1}{x} + x) \Rightarrow R = (-\infty, -1]$ $R = [1, +\infty) \cup (-\infty, -1]$	۱
$y = \frac{x^2+1}{x+1}$ $yx + y = x^2 + 1 - x - 1$ $x^2 + (1-y)x - 1 = 0$ $\Delta = (1-y)^2 - 4(-1) \geq 0 \Rightarrow (y-1)^2 + 4 \geq 0 \Rightarrow y^2 - 2y + 5 \geq 0$ $y^2 - 2y + 5 = (y-1)^2 + 4 \geq 0 \Rightarrow R = (-\infty, -\frac{1}{2}] \cup (\frac{1}{2}, +\infty)$	۲
$f(x) = \frac{x^2 - x + \frac{1}{2}}{x^2 - x + 1} \rightarrow \Delta < 0 \Rightarrow D_f = \mathbb{R}$ ب) $y = \frac{x^2 - x + \frac{1}{2}}{x^2 - x + 1} \Rightarrow (y-1)x^2 + (1-y)x + y - \frac{1}{2} = 0 \quad y \neq 1 \quad (I)$ $\Delta = (1-y)^2 - 4(y - \frac{1}{2}) \geq 0 \Rightarrow -y^2 + 2y - 2y + 1 + 2 - 2 = 1 - y \geq 0 \Rightarrow y \leq 1$ $(I) \cap (II) \Rightarrow R = [0, 1]$	۳
الف) $y = \sqrt{-x^2 + 4x - 1}$ $\max y = 2 \Rightarrow R = \sqrt{(-\infty, 4]} = [0, 2]$ ب) $y = \sqrt{2x^2 - 12x}$ $\min y = 0 \Rightarrow R = \sqrt{[-1, +\infty)} = [-2, +\infty)$	۴
الف) $y = \log(x^2 - x + 1) = \log 1 = \log 1 = 0 \Rightarrow R = (-\infty, +\infty) = \mathbb{R}$ ب) $y = \log_p \frac{x^2+1}{x} \Rightarrow \frac{x^2+1}{x} = x + \frac{1}{x} \Rightarrow R_{\frac{x^2+1}{x}} = [1, +\infty) \Rightarrow \log_p [1, +\infty) \Rightarrow R = [1, +\infty)$	۵

الف) $y = 2x-1 - x-4$ $R_{\text{الف}} = [-1, +\infty)$	ب) $y = x-4 + x+1$ $R_{\text{ب}} = [4, +\infty)$
$x-2 - 2x+1 \leq 1$ (I) $x-2-2x-1 \leq 1 \Rightarrow -x-3 \leq 1 \Rightarrow -x \leq 4 \Rightarrow x \geq -4$ (II) $x-2-(-2x-1) \leq 1 \Rightarrow x-2+2x+1 \leq 1 \Rightarrow 3x-1 \leq 1 \Rightarrow 3x \leq 2 \Rightarrow x \leq \frac{2}{3}$ (III) $-(x-2)-(2x+1) \leq 1 \Rightarrow -x+2-2x-1 \leq 1 \Rightarrow -3x+1 \leq 1 \Rightarrow -3x \leq 0 \Rightarrow x \geq 0$ $(I) \cap (II) \cap (III) = (-\infty, -4] \cup [\frac{2}{3}, +\infty)$	4
$y = x-1 + x+1 + x$ $R_y = \mathbb{R}$	8
الف) $y = [x] + [-x] + 3$ $x \in \mathbb{Z} \Rightarrow 0 + 3 = 3$ $x \notin \mathbb{Z} \Rightarrow -1 + 3 = 2$ $R_{\text{الف}} = \{2, 3\}$	ب) $y = [x] - [x]$ $x \in \mathbb{Z} \Rightarrow y = 0$ $x \notin \mathbb{Z} \Rightarrow y = 1$ نویز: $[-2, 2]$ هر خطی که $R_{\text{ب}} = \mathbb{R}$ $R_y = [-2, 2]$
$y = \sin^2 x - \sin x + 1$ $\sin x = -1 \Rightarrow y = 3$ $\sin x = 1 \Rightarrow y = 1$ $\sin x = \frac{1}{2} \Rightarrow y = \frac{11}{4}$ $R_y = [\frac{11}{4}, 3]$	$y = \sin^2 x + \sin x + 1$ $\sin x = 0 \Rightarrow y = 1$ $\sin x = 1 \Rightarrow y = 3$ $\sin x = -\frac{1}{2} \Rightarrow y = \frac{11}{4}$ $R_y = [1, 3]$